



Subject Overview 2018 – 2019

Department Name:	Science
Head of Department:	Mrs Brooks
Subject Teachers:	<p>Teaching Staff: Mrs J Randall (Head of Key Stage 3 and Second in Department) Miss R Prideaux (Head of Key Stage 4), Miss E Warren (Head of Key Stage 5) [Maternity leave], Mr Brock (Teaching and Learning Lead), Mr B Hasemore, Mr O Badmos, Mrs P Gepi-Attee Mr A Shoneyin,</p> <p>Technician Staff: Mrs J Trice (Senior Technician) Mrs M Casey</p>
Accommodation and Resources:	<p>Teaching is divided into seven laboratories and a classroom. The laboratories are equipped with gas taps, electric sockets, water supply and waste disposal to make a wide variety of practicals for Biology, Chemistry, and Physics available to students. Two laboratories have computer access and there are some notebook computers.</p> <p>There are also two laboratory preparation areas, where students have access to additional materials and stationery.</p>
What will students learn in each year?	
Year 7	<p>Term 1: <u>Sets 1 and 4</u> Introduction to Science Passport B1 Chapter 1: Cells Biology RPA – Microscope Revision for Term 1 cumulative assessment <u>Sets 2 and 3</u> Introduction to Science Passport C1 Chapter 1: Particles and Behaviour Chemistry RPA – Melting and boiling points</p>



	Revision for Term 1 cumulative assessment
	Term 2: <u>Sets 1 and 4</u> C1 Chapter 1: Particles and Behaviour C2 Chapter 2: Separating Techniques Chemistry RPA – Melting and boiling points Revision for Term 2 cumulative assessment <u>Sets 2 and 3</u> B1 Chapter 1: Cells C2 Chapter 2: Separating Techniques Biology RPA – Microscope Revision for Term 2 cumulative assessment
	Term 3: <u>Sets 1 and 4</u> P1 Chapter 1: Forces (5 lessons) P1 Chapter 2: Sound (5 lessons) Physics RPA – Forces Revision for Term 3 cumulative assessment <u>Sets 2 and 3</u> C1 Chapter 2: Elements and Compounds (4 lessons) C1 Chapter 4: Acids and Alkalis (4 lessons) Chemistry RPA – Neutralisation Revision for Term 3 cumulative assessment
	Term 4: <u>Sets 1 and 4</u> C1 Chapter 2: Elements and Compounds C1 Chapter 4: Acids and Alkalis Revision for Term 4 cumulative assessment <u>Sets 2 and 3</u> P1 Chapter 1: Forces (5 lessons) P1 Chapter 2: Sound (5 lessons) Physics RPA – Forces Revision for Term 4 cumulative assessment
	Term 5: <u>Sets 1 and 4</u> P2 Chapter 1 Electricity First then Magnetism (8 lessons) Physics RPA – Potential difference Long revision for End of year cumulative assessment (to cover all topics taught in year 7) <u>Sets 2 and 3</u> P2 Chapter 1 Magnetism first, then Electricity (8 lessons) Physics RPA – Potential difference Long revision for End of year cumulative assessment (to cover all topics taught in year 7)
	Term 6: <u>Sets 1 and 4</u>



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	<p>End of year Cumulative assessment B1 Chapter 2: Structure and Function of Body Systems (6 lessons) B1 Chapter 3: Reproduction (Just human) (5 lessons) Biology RPA - Diffusion <u>Sets 2 and 3</u> End of year Cumulative assessment B1 Chapter 2: Structure and Function of Body Systems (6 lessons) B1 Chapter 3: Reproduction (Just human) (5 lessons) Biology RPA – Diffusion</p>
Year 8	<p>Term 1: <u>Sets 1 and 4</u> C1 Chapter 3: Reactions (5 lessons) C2 Chapter 1: Periodic Table (5 lessons) Chemistry RPA – Conservation of mass Revision for term 1 cumulative assessment <u>Sets 2 and 3</u> B2 Chapter 1: Health and Lifestyle (9 lessons) Biology RPA – Food testing (fats, proteins and carbohydrates) Revision for term 1 cumulative assessment</p>
	<p>Term 2: <u>Sets 1 and 4</u> B2 Chapter 1: Health and Lifestyle (9 lessons) Biology RPA – Food testing (fats, proteins and carbohydrates) Revision for Term 2 cumulative assessment <u>Sets 2 and 3</u> C1 Chapter 3: Reactions (5 lessons) C2 Chapter 1: Periodic Table (5 lessons) Chemistry RPA – Conservation of mass Revision for term 2 cumulative assessment</p>
	<p>Term 3: <u>Sets 1 and 4</u> P2 Chapter 2: Energy – Waves (8 lessons) P2 Chapter 3: Motion and Pressure (6 lessons) Physics RPA – Acceleration Revision for Term 3 cumulative assessment <u>Sets 2 and 3</u> B2 Chapter 3: Adaptation and Inheritance B3 Chapter 2: Turning points in biology Biology RPA – Growing microbes Revision for Term 3 cumulative assessment</p>



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	<p>Term 4:</p> <p><u>Sets 1 and 4</u> B2 Chapter 3: Adaptation and Inheritance (7 lessons) B3 Chapter 2: Turning points in biology (7 lessons) Biology RPA – Growing microbes Revision for Term 3 cumulative assessment</p> <p><u>Sets 2 and 3</u> P2 Chapter 2: Energy Waves (8 lessons) P2 Chapter 3: Motion and Pressure (6 lessons) Physics RPA – Acceleration Revision for Term 3 cumulative assessment</p>
	<p>Term 5:</p> <p><u>Sets 1 and 4</u> C3 Chapter 2: Turning points in chemistry (6 lessons) P3 Chapter 2: Turning points in physics (7 lessons) Long revision for End of year cumulative assessment (to cover all topics taught in year 8)</p> <p><u>Sets 2 and 3</u> P3 Chapter 2: Turning points in physics (7 lessons) C3 Chapter 2: Turning points in chemistry (6 lessons) Revision End of year cumulative assessment</p>
	<p>Term 6:</p> <p><u>Sets 1 and 4</u> End of year Cumulative assessment Science project</p> <p><u>Sets 2 and 3</u> End of year Cumulative assessment Science project</p>
Year 9	<p>Exam Board: AQA Qualification: Combined Science: Trilogy</p>
	<p>Term 1:</p> <p>Chemistry: Atomic structure: structure and history of the atom, chemical equations and various methods of separating mixtures. Biology: Cell structure and transport: specialisation, diffusion, osmosis Physics: Conservation and dissipation of energy: changes in energy and conservation, GPE, KE and work done and energy dissipation.</p> <p>Cumulative Assessment 1</p>



	<p>Term 2:</p> <p>Chemistry: Atomic structure: electronic structure. The periodic table: development of the periodic table, links between electronic structure and the periodic table and trends in reactivity of group 1 and group 7 elements.</p> <p>Biology: Required practical assessment: Osmosis, Cells and organisation: Active transport. Cell division: growth and differentiation.</p> <p>Physics: Conservation and dissipation of energy: efficiency, electrical appliances and power calculations. Energy transfer by heating: conduction and specific heat capacity.</p> <p>Cumulative Assessment 2</p>
	<p>Term 3:</p> <p>Chemistry: The periodic table: explaining trends. Structure and bonding: states of matter and ionic bonding.</p> <p>Biology: Cell division: Stem cells and dilemmas Organisation and the digestive system: Tissues and organs, human digestive system, the chemistry of food.</p> <p>Physics: Required practical assessment: specific heat capacity. Energy transfer by heating: Insulating buildings. Energy resources: demands and renewable energy.</p> <p>Cumulative Assessment 3</p>
	<p>Term 4:</p> <p>Chemistry: Structure and bonding: giant ionic structures, covalent bonding, simple molecules, structure and properties of fullerenes and graphene and metallic bonding.</p> <p>Biology: Required practical assessments: 1) Food tests 2) Effect of pH on enzymes. Organisation and the digestive system: Enzymes and factors affecting.</p> <p>Physics: Required practical assessment: resistance. Energy resources: renewable energy and energy issues. Electric circuits: current, charge and resistance.</p> <p>Cumulative Assessment 4</p>
	<p>Term 5:</p> <p>Chemistry: Chemical calculations: relative formula mass and moles, balancing equations, reacting masses and expressing concentrations.</p>



	<p>Biology: Organising animals and plants: Blood, heart, and breathing. Plant structure and transport systems.</p> <p>Physics: Electric circuits: components, series and parallel circuits.</p> <p>Cumulative Assessment 5</p>
	<p>Term 6:</p> <p>Chemistry: Required practical assessment: making salts. Chemical changes: reactivity series and displacement reactions, extraction of metals and making salts.</p> <p>Biology: Communicable diseases: Pathogens and diseases, viral, bacterial, fungal infections.</p> <p>Physics: Required practical assessment: density. Electricity in the home: current, cables and plugs, power and energy transfer, appliances and efficiency. Molecules and matter: density.</p>
Year 10	<p>Exam Board: AQA</p> <p>Qualification: Combined Science: Trilogy</p>
	<p>Term 1:</p> <p>Chemistry: Electrolysis and required practical assessment: Electrolysis</p> <p>Biology: Communicable diseases: Pathogens and diseases, viral, bacterial, fungal infections. Preventing and treating disease: vaccinations and antibiotics.</p> <p>Physics: Required practical assessment: force and acceleration. Motion: distance-time and velocity-time graphs. Force and motion: acceleration.</p> <p>Cumulative Assessment 1</p>
	<p>Term 2:</p> <p>Chemistry: Energy changes: reaction profiles, bond energy calculations, and required practical assessment: temperature changes in reacting solutions.</p> <p>Biology: Preventing and treating disease: Discovering and developing drugs. Non-communicable diseases: Cancer, smoking, alcohol and risk factors, diet, exercise, and disease.</p> <p>Physics: Required practical assessment: force and extension for a spring (Hooke's Law). Force and Motion: terminal velocity, braking, momentum and elasticity.</p>



	Cumulative Assessment 2
	Term 3: Chemistry: Rates of Reaction: collision theory, factors affecting rates of reaction. Biology: Required practical assessment: Photosynthesis. Photosynthesis: rate and factors affecting photosynthesis, use of glucose. Physics: Wave properties: nature and property of waves, inc. calculations, reflection and refraction. Cumulative Assessment 3
	Term 4: Chemistry: Required practical assessment: Rates of reaction effect of concentration. Reversible reactions and equilibrium. Biology: Required practical assessment: reaction times. Making the most of photosynthesis, Respiration: Aerobic and anaerobic respiration, exercise and metabolism. Human Nervous System: Principles of homeostasis and structure and function of the nervous system Physics: Required practical assessments: 1) waves 2) infrared radiation. Electromagnetic spectrum: types of waves. Cumulative Assessment 4
	Term 5: Chemistry: Crude oil and fuels: Hydrocarbons, fractional distillation, cracking and burning fuels. Chemical Analysis: substances, chromatography. Biology: Human Nervous System: reflex actions, Hormonal Coordination: Control of blood glucose and diabetes, negative feedback, human reproduction. Physics: Electromagnetic waves: communication, x-rays and uses. Electromagnetism: magnetic fields. Cumulative Assessment 5
	Term 6: Chemistry: Required practical assessment: analysing chromatograms, calculating R _f values. Chemical Analysis: test for gases. Earth's atmosphere: History and evolving atmosphere, greenhouse gases.



	<p>Biology: Hormonal Coordination: hormonal involvement in the menstrual cycle and controlling fertility. Reproduction: Types of reproduction, cell division in reproduction and DNA.</p> <p>Physics: Electromagnetism: electromagnets, motor effect and revision.</p>
Year 11	<p>Exam Board: AQA</p> <p>Qualification: Combined Science: Trilogy</p>
	<p>Term 1:</p> <p>Chemistry: Revision for mock paper 1. Required practical assessment: temperature changes in solutions. Energy changes: exothermic and endothermic reactions, reaction profiles and bond energy calculations. Biology: Revision for mock paper 1. Respiration: aerobic and anaerobic, metabolism and liver. Human nervous system: structure and homeostasis.</p> <p>Physics: Revision for mock paper 1. Motion: distance-time and velocity-time graphs.</p> <p>Combined Science: Trilogy mock paper 1.</p>
	<p>Term 2:</p> <p>Chemistry: Rates and equilibrium: collision theory and the effect of surface area, temperature, concentration and pressure on the rate of reaction.</p> <p>Biology: Required practical assessment: reaction times. Human nervous system: reflex actions. Hormonal coordination: hormonal control, negative feedback, blood glucose, diabetes, menstrual cycle and fertility treatments.</p> <p>Physics: Required practical assessment: force and acceleration. Force and motion: acceleration, weight, terminal velocity, forces and braking.</p> <p>Mock exams paper 1</p>
	<p>Term 3:</p> <p>Chemistry: Required practical assessment: concentration. Rates and equilibrium: catalysts, reversible reactions and dynamic equilibrium. Crude oil and fuels: hydrocarbons, fractional distillation and cracking. Chemical analysis: pure substances and formulations, chromatography.</p>



	<p>Biology: Reproduction: cell division, DNA, inheritance, genetics, inherited disorders and screening. Variation and evolution: variation, natural selection, selective breeding, ethics of genetic engineering. Genetics and evolution: evolution, fossils, extinction, classification and antibiotic resistant bacteria.</p> <p>Physics: Required practical assessment: force and extension for a spring (Hooke's Law). Force and motion: momentum, forces and elasticity. Wave properties: nature and property of waves, inc. calculations, reflection and refraction.</p>
	<p>Term 4:</p> <p>Chemistry: Required practical assessments: 1) chromatography 2) water testing. Analysing substances, gas tests. Earth's atmosphere: History and evolving atmosphere, greenhouse gases, climate change and pollutants. Earth's resources: finite and renewable, water treatment and purification and metal extraction.</p> <p>Biology: Required practical assessment: transects. Adaptations, interdependence and competition: communities, organisms and the environment, competition, adaptation. Organising an ecosystem: carbon cycle and feeding relationships.</p> <p>Physics: Required practical assessments: 1) waves 2) infrared radiation. Electromagnetic spectrum: types of waves, communication, x-rays and gamma rays. Electromagnetism: magnetic fields.</p>
	<p>Term 5:</p> <p>Chemistry: Earth's resources: life cycle assessments and recycling. Revision</p> <p>Biology: Biodiversity and ecosystems: population explosion, pollution, deforestation, global warming and biodiversity. Revision.</p> <p>Physics: Electromagnetism: the motor effect. Revision.</p>
	<p>Term 6:</p> <p>Chemistry: Revision.</p> <p>Biology: Revision</p> <p>Physics: Revision</p>
Year 12	<p>Exam Board: AQA</p> <p>Qualification: Level 3 Extended Certificate Applied Science</p>



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	<p>Term 1:</p> <p><u>Unit 1: Examined</u> Biology: Cell structure and transport mechanisms. Chemistry: Atomic structure and the periodic table, and amount of substance <u>Unit 2: Coursework</u> (internally assessed) Physics: Specific Heat Capacity <u>Unit 3 Examined</u> Pre-release material: Antibiotic and resistance, DNA, and fracking.</p>
	<p>Term 2:</p> <p><u>Unit 1 Examined</u> Biology: Breathing and cellular respiration, structure and function of the heart and homeostasis. Chemistry: Bonding and structure, and enthalpy changes. <u>Unit 2: Coursework</u> (internally assessed) Physics: Resistivity <u>Unit 3 Examined</u> Pre-release material: Antibiotic and resistance, DNA, and fracking.</p>
	<p>Term 3:</p> <p><u>Unit 1: Examined</u> Biology: Photosynthesis and food chain productivity. Physics: Useful energy and efficiency, electricity and circuits and dynamics. <u>Unit 2: Coursework</u> (internally assessed) Chemistry: Titration <u>Unit 3 Examined</u> Pre-release material: Antibiotic and resistance, DNA, and fracking.</p>
	<p>Term 4:</p> <p><u>Unit 1: Revision</u> <u>Unit 2: Coursework:</u> Chemistry: Colorimetry <u>Unit 3 Revision:</u> Pre-release preparation</p>
	<p>Term 5:</p> <p><u>Unit 1 Revision</u> <u>Unit 3 Pre-release preparation</u></p>
	<p>Term 6:</p> <p><u>Examinations: Unit 1 and 3</u> <u>Unit 5:</u> Research project introduction <u>Unit 6a:</u> Microbiology project introduction</p>



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Year 12	
Year 12	Exam Board: OCR A Qualification: A Level Biology
	Term 1: maths skills: statistical analysis Module 2: cell structure and biological molecules: polysaccharides, amino acids, polypeptides, lipid structure, measuring cells, cytoskeleton, and organelles. Required practical – PAG: Amino acids in egg white using chromatography
	Term 2: Module 2: cell membranes and enzymes: membrane transport, substrate concentration, enzyme catalysis. Required practical – PAG: water potential of potato; Rate of diffusion through a membrane
	Term 3: Module 2: cell division and nucleic acids: mitosis, meiosis, animal and plant tissues, stem cells, DNA replication and protein synthesis. Module 3: exchange surfaces: gas exchange and efficiency. Required practical – PAG: Using a light microscope to study mitosis
	Term 4: Module 3: transport animals and transport plants: circulatory system, the heart and cardiac cycle, transpiration, evaporation and factor affecting. Required practical – PAG: Examine lung tissue using a light microscope
	Term 5: Module 4: biodiversity, communicable diseases, classification and evolution: habitats, species evenness and species richness, maintaining biodiversity, malaria, TB, AIDS, deadly diseases, antibodies, immune response, developing new drugs, plant defences, genomics and proteomics, Charles Darwin, standard deviation, statistics.
	Term 6: Revision Mock
Year 13	
Year 13	Exam Board: AQA Qualification: Level 3 Extended Certificate Applied Science
	Term 1: Unit 2: Coursework submission



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	<p>Unit 5: Investigation into factors affecting fermentation in the brewery industry Trials, main experiments and first draft write up</p> <p>Unit 6a: microbiology research, practical experiments: microorganisms: growing, staining, and testing factors to eliminate microorganisms. First draft write up.</p> <p>Unit 4: examined unit The human body: digestive system and diet, muscular-skeletal system and movement.</p>
	<p>Term 2:</p> <p>Unit 5: final write up and submission</p> <p>Unit 6a: final write up and submission</p> <p>Unit 4: examined unit The human body: Oxygen transport in the blood, physiological measurements and application, structure and function of nervous system and brain, nerve impulses.</p>
	<p>Term 3:</p> <p>Unit 2, 5 and 6a: Amendments to coursework for resubmission to improve grades.</p> <p>Unit 4: Revision and exam</p>
	<p>Term 4:</p> <p>Unit 2, 5 and 6a: Amendments to coursework for resubmission to improve grades. Final resubmission of coursework elements. Unit 1, 3 and 4 revision for retakes if required.</p>
	<p>Term 5:</p> <p>Unit 1, 3 and 4 revision for retakes for grade improvement if required.</p>
	<p>Term 6:</p> <p>Exams 1, 3 and 4</p>
Extra-Curricular Activities:	Science Event running Terms 2-5 one per year group.